

MANAGUA/AUGUSTO NK

Latitude = 12.15 N

Longitude = 86.17 W

Period of Record = 1973 to 1996

WMO No. 787410

Elevation = 164 feet

Average Pressure = 29.64 inches Hg

Design Criteria Data

	Design Value	Mean Coincident (Average) Values			
		Wet Bulb Temperature (°F)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Dry Bulb Temperature (T)	(°F)				
Median of Extreme Highs	97	76	104	7.8	E
0.4% Occurrence	95	76	103	7.5	E
1.0% Occurrence	95	76	103	7.5	E
2.0% Occurrence	93	75	102	7.9	E
Mean Daily Range	16	-	-	-	-
97.5% Occurrence	68	66	93	0.3	SE
99.0% Occurrence	67	65	91	0.4	SE
99.6% Occurrence	66	64	87	0.4	MISSING
Median of Extreme Lows	64	62	81	0.4	SE
	Design Value	Mean Coincident (Average) Values			
		Dry Bulb Temperature (°F)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Wet Bulb Temperature (T_{wb})	(°F)				
Median of Extreme Highs	82	89	151	5.2	E
0.4% Occurrence	80	89	137	4.8	E
1.0% Occurrence	79	87	134	4.4	E
2.0% Occurrence	79	87	134	4.4	E
	Design Value	Mean Coincident (Average) Values			
		Dry Bulb Temperature (°F)	Vapor Pressure (in. Hg)	Wind Speed (mph)	Prevailing Direction (NSEW)
Humidity Ratio (HR)	(gr/lb)				
Median of Extreme Highs	161	85	1.06	6.8	E
0.4% Occurrence	143	84	0.94	3.4	E
1.0% Occurrence	142	84	0.94	3.4	E
2.0% Occurrence	140	84	0.92	1.7	E
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		305	4204	5113	8158

Other Site Data

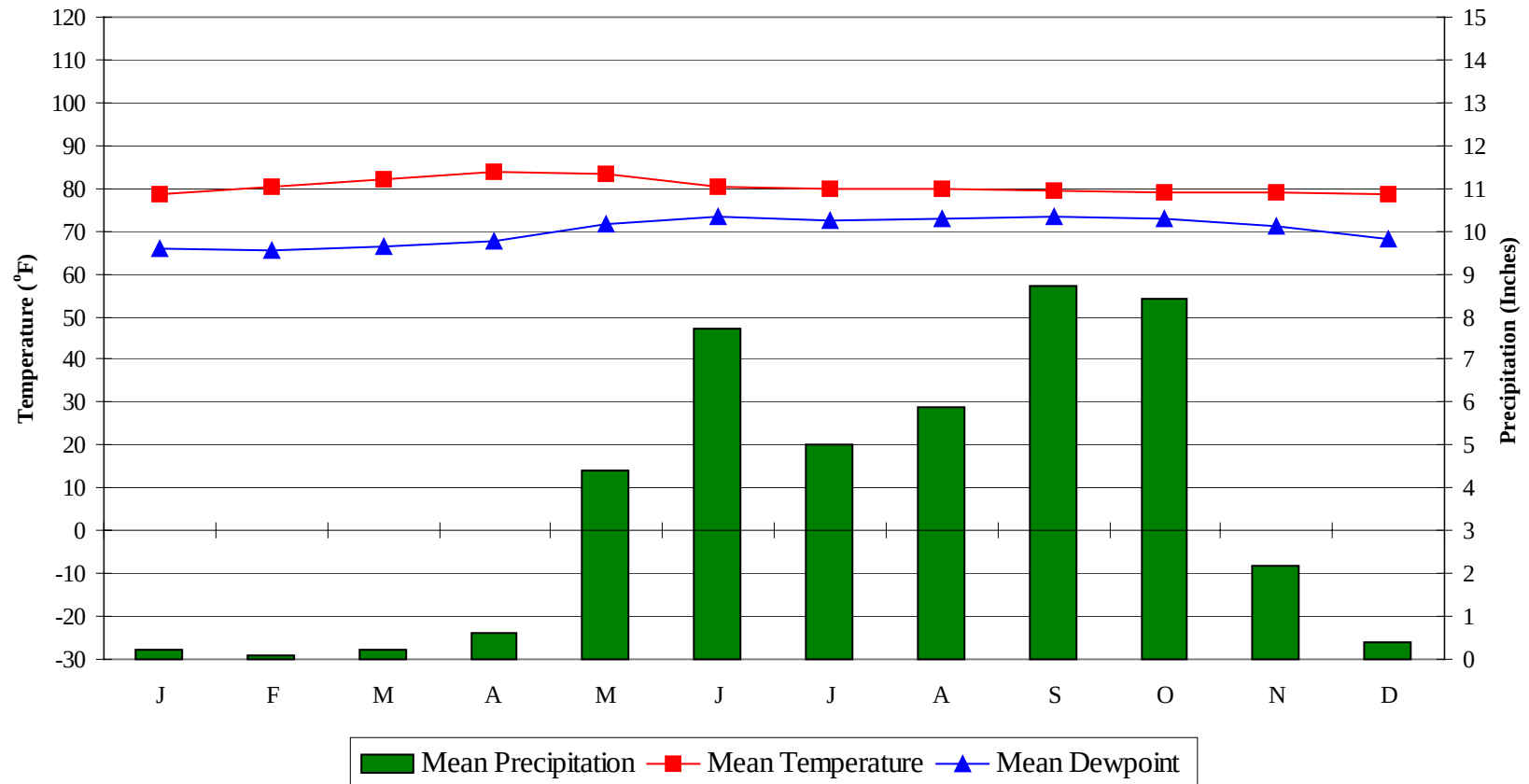
Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75°F-RH 60% Latent + Sensible
10	N/A	N/A	7.8 + 4.0
Ground Water Temperature (°F) 50 Foot Depth *	Frost Depth 50 Year Recurrence (in.)	Ground Snow Load 50 Year Recurrence (lb/ft ²)	Average Annual Freeze-Thaw Cycles (#)
82.8	N/A	N/A	0

*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.

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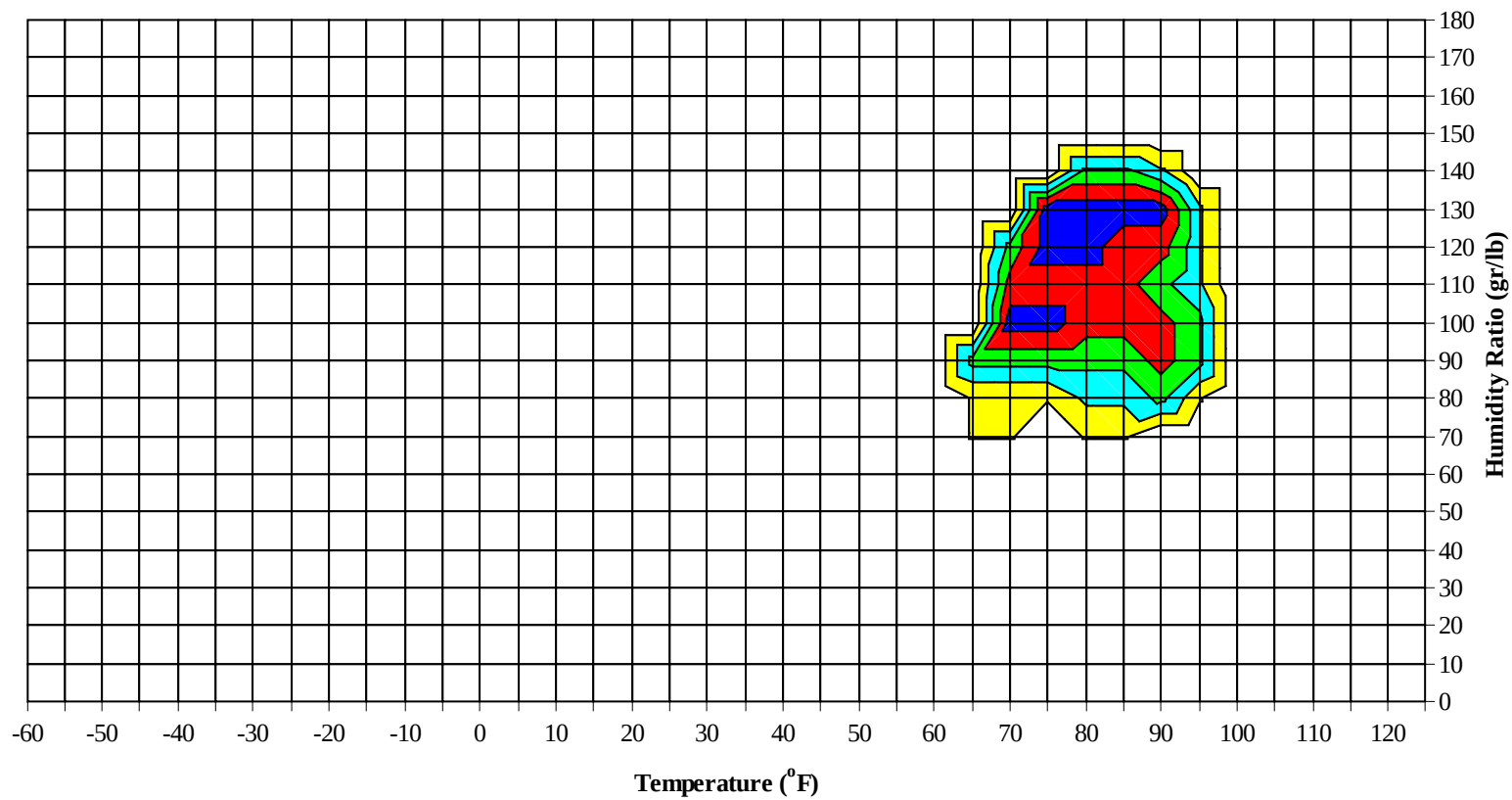
Average Annual Climate



MANAGUA/AUGUSTO NK

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Long Term Psychrometric Summary

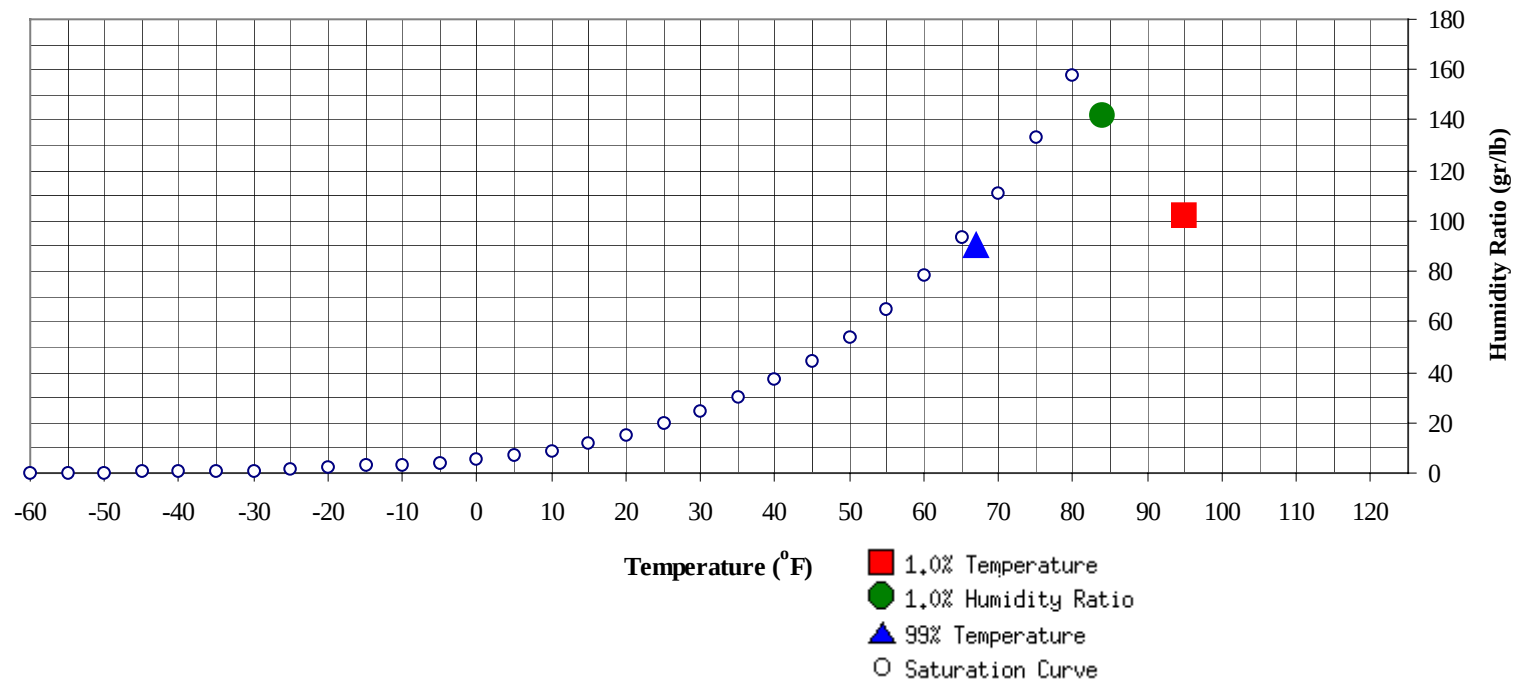


- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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Psychrometric Summary of Peak Design Values



	(°F)	MCHR (gr/lb)	Enthalpy (btu/lb)	1.0% Humidity Ratio	(gr/lb)	MCDB (°F)	MCWB (°F)	MC Dewpt (°F)	Enthalpy (btu/lb)
99% Dry Bulb	67	90.1	30.1		142.1	84	78.8	77	42.5

1.0% Dry Bulb	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
	95	102.6	75.6	39.0

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Dry-Bulb Temperature Hours For An Average Year (Sheet 1 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	January					February					March				
	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00		
100 / 104															
95 / 99		0		0	74.0		2		2	74.1		23	1	24	75.5
90 / 94		54	1	55	73.5		91	6	98	72.7	0	124	20	144	73.1
85 / 89	0	100	14	114	72.1	0	73	26	99	71.7	0	63	41	104	72.6
80 / 84	3	80	56	139	71.5	8	53	65	126	71.3	25	35	97	157	72.3
75 / 79	44	13	107	164	70.3	61	5	96	162	70.1	98	3	81	182	70.7
70 / 74	120	1	64	185	68.3	111	0	30	141	68.0	101	0	8	110	68.1
65 / 69	69	0	6	75	65.4	37	0	1	38	65.0	21		0	21	65.1
60 / 64	12		0	12	61.6	8	0		8	61.7	2			2	62.1
55 / 59						0			0	58.0					

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

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Dry-Bulb Temperature Hours For An Average Year (Sheet 2 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	April					May					June				
	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00		
100 / 104															
95 / 99		46	2	48	75.2		42	3	45	76.6		2	0	2	79.7
90 / 94	0	126	34	159	74.0	0	108	27	135	76.2		55	3	58	78.0
85 / 89	2	48	49	99	73.6	4	57	44	105	76.0	1	90	14	106	77.3
80 / 84	49	19	107	175	73.3	60	29	104	192	75.4	27	74	60	160	76.1
75 / 79	125	1	46	172	71.2	150	11	65	225	73.8	143	18	148	310	74.4
70 / 74	61		2	63	68.8	34	1	5	40	71.3	69	1	14	85	71.7
65 / 69	3			3	65.1						0	0	0	0	61.5
60 / 64															
55 / 59															

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

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Dry-Bulb Temperature Hours For An Average Year (Sheet 3 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	July					August					September				
	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00		
100 / 104															
95 / 99		0		0	72.0		0		0	79.0		1		1	76.9
90 / 94		41	1	42	77.3		52	2	54	77.7		45	1	46	78.0
85 / 89	0	102	12	114	76.7	0	100	12	113	77.0	0	91	9	100	77.5
80 / 84	23	83	51	157	75.5	24	80	51	154	75.9	18	80	37	136	76.3
75 / 79	120	20	153	293	73.8	119	14	150	283	74.0	95	21	153	269	74.3
70 / 74	104	2	31	137	71.3	105	2	33	140	71.6	126	2	40	168	71.8
65 / 69	1			1	66.6	0	0	0	0	66.4	0			0	68.0
60 / 64															
55 / 59															

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

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Dry-Bulb Temperature Hours For An Average Year (Sheet 4 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	October					November					December				
	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00		
100 / 104															
95 / 99															
90 / 94		31	0	31	78.0		40	1	41	76.4		0		0	73.0
85 / 89		106	6	112	77.1		111	6	117	75.7		40	0	40	74.7
80 / 84	17	93	36	146	76.1	16	78	44	138	74.8	0	118	9	127	73.7
75 / 79	78	17	154	249	74.2	61	10	130	201	73.4	11	80	53	144	72.8
70 / 74	150	2	52	204	71.5	145	1	57	203	70.6	54	10	115	179	71.8
65 / 69	2		0	2	67.7	17		2	19	66.6	131	0	66	197	69.3
60 / 64											45	0	5	50	65.6
55 / 59						1			1	62.6	7		0	7	62.0

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

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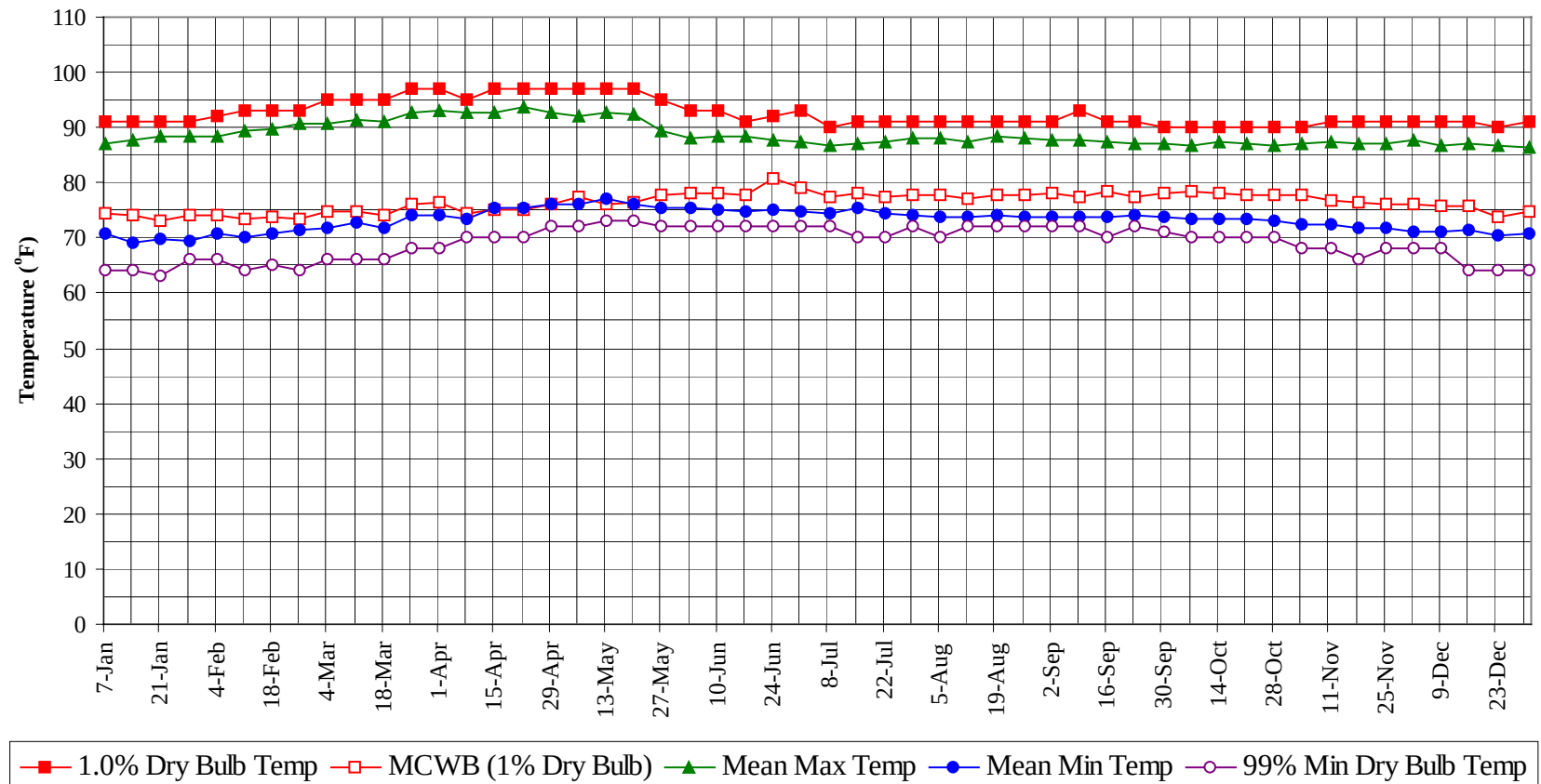
Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)

Period of Record = 1973 to 1996

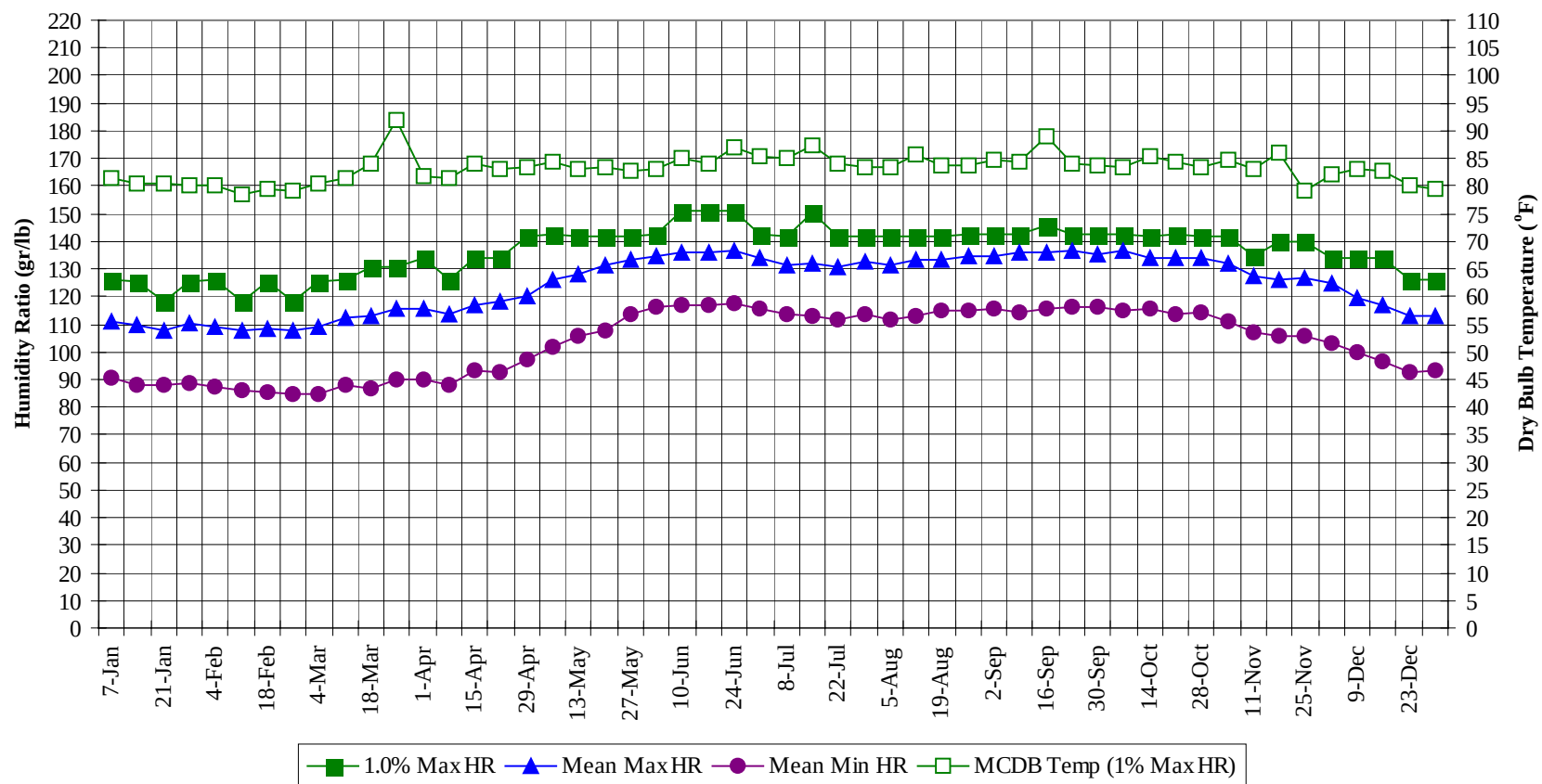
Annual Totals					
Temperature Range (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00		
100 / 104		0		0	78.0
95 / 99		114	5	119	75.8
90 / 94	0	813	95	908	75.1
85 / 89	8	1058	243	1309	75.1
80 / 84	277	783	758	1818	74.3
75 / 79	1139	141	1394	2674	73.0
70 / 74	1269	10	408	1687	70.2
65 / 69	198	1	15	215	65.5
60 / 64	29	0	1	30	61.8
55 / 59	0			0	58.0

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

Annual Summary of Temperatures



Long Term Humidity and Dry Bulb Temperature Summary

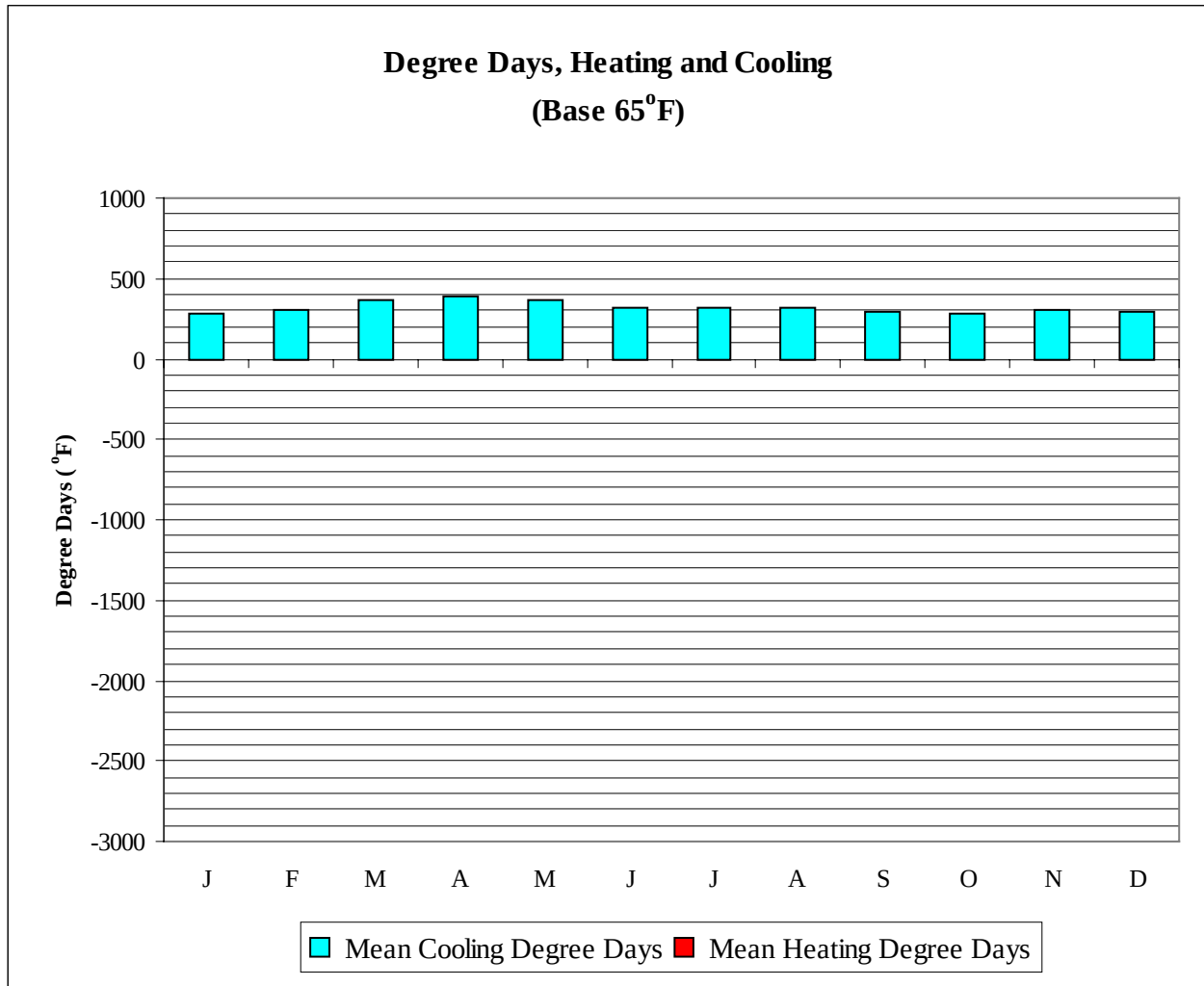


MANAGUA/AUGUSTO NK

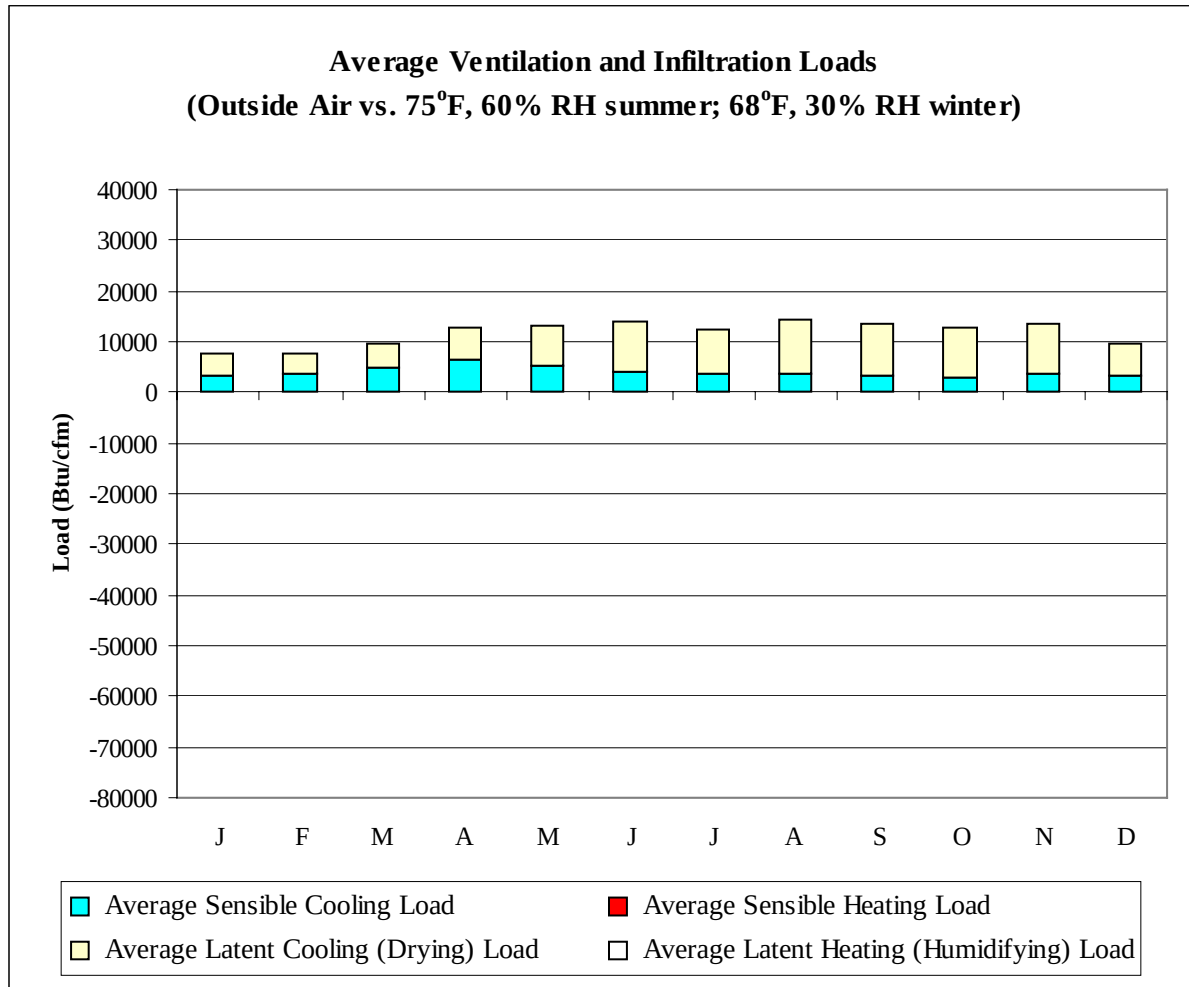
WMO No. 787410

Long Term Dry Bulb Temperature and Humidity Summary

Week Ending	1.0% Temp (°F)	MCWB @ 1% Temp (°F)	Mean Max Temp (°F)	Mean Min Temp (°F)	99% Temp (°F)	1.0% HR (gr/lb)	MCDB @ 1% HR (°F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	91.0	74.6	87.2	70.9	64.0	126.0	81.6	111.0	90.8
14-Jan	91.0	74.0	87.9	69.3	64.0	125.3	80.4	109.7	88.2
21-Jan	91.0	73.1	88.4	69.9	63.0	118.3	80.4	107.9	87.8
28-Jan	91.0	74.1	88.5	69.6	66.0	125.3	80.0	110.1	88.4
4-Feb	92.0	74.0	88.3	70.8	66.0	126.0	80.1	108.9	87.2
11-Feb	93.0	73.4	89.5	70.3	64.0	118.3	78.4	108.0	85.7
18-Feb	93.0	73.9	89.6	70.7	65.0	125.3	79.5	108.1	85.6
25-Feb	93.0	73.5	90.8	71.5	64.0	118.3	79.1	108.0	85.0
4-Mar	95.0	74.9	90.8	71.6	66.0	125.3	80.6	108.7	84.8
11-Mar	95.0	74.8	91.4	72.7	66.0	126.0	81.4	112.0	87.8
18-Mar	95.0	74.2	91.2	71.8	66.0	130.9	84.0	113.0	86.9
25-Mar	97.0	76.2	92.7	74.1	68.0	130.9	92.0	115.3	90.0
1-Apr	97.0	76.5	93.0	74.2	68.0	133.7	81.8	115.9	89.7
8-Apr	95.0	74.4	92.8	73.5	70.0	126.0	81.6	113.7	88.3
15-Apr	97.0	75.3	92.6	75.4	70.0	133.7	84.2	117.1	93.2
22-Apr	97.0	75.2	93.6	75.3	70.0	133.7	83.1	118.0	92.8
29-Apr	97.0	76.1	92.6	76.1	72.0	142.1	83.3	120.2	97.2
6-May	97.0	77.5	92.0	76.2	72.0	142.8	84.4	126.4	101.9
13-May	97.0	76.2	92.8	77.2	73.0	142.1	83.2	127.9	105.7
20-May	97.0	76.4	92.3	76.2	73.0	142.1	83.5	131.1	107.4
27-May	95.0	77.7	89.5	75.4	72.0	142.1	82.7	133.0	113.7
3-Jun	93.0	78.0	87.9	75.3	72.0	142.8	83.1	135.0	116.1
10-Jun	93.0	78.1	88.5	75.1	72.0	151.2	85.2	135.9	116.8
17-Jun	91.0	77.8	88.5	74.8	72.0	151.2	84.1	136.1	116.9
24-Jun	92.0	80.7	87.7	75.3	72.0	151.2	87.0	136.4	117.3
1-Jul	93.0	79.2	87.5	74.8	72.0	142.8	85.5	134.1	115.5
8-Jul	90.0	77.3	86.9	74.3	72.0	142.1	85.0	131.6	113.5
15-Jul	91.0	78.0	87.2	75.4	70.0	150.5	87.3	131.9	113.1
22-Jul	91.0	77.3	87.4	74.3	70.0	142.1	84.2	130.5	111.5
29-Jul	91.0	77.9	87.9	74.1	72.0	142.1	83.5	132.8	113.4
5-Aug	91.0	77.9	88.0	73.9	70.0	142.1	83.4	131.3	111.9
12-Aug	91.0	77.2	87.4	73.9	72.0	142.1	85.7	133.6	113.1
19-Aug	91.0	77.8	88.3	74.3	72.0	142.1	83.6	133.6	114.8
26-Aug	91.0	77.7	88.2	73.9	72.0	142.8	83.6	134.8	115.0
2-Sep	91.0	78.1	87.9	73.8	72.0	142.8	84.8	134.8	115.3
9-Sep	93.0	77.6	87.7	73.9	72.0	142.8	84.4	135.9	114.4
16-Sep	91.0	78.3	87.5	73.8	70.0	145.6	89.0	136.0	115.3
23-Sep	91.0	77.4	86.9	74.1	72.0	142.8	84.1	136.4	116.4
30-Sep	90.0	78.2	86.9	73.8	71.0	142.8	83.7	135.5	115.9
7-Oct	90.0	78.5	86.8	73.4	70.0	142.8	83.5	136.4	115.0
14-Oct	90.0	78.1	87.4	73.3	70.0	142.1	85.4	133.9	115.4
21-Oct	90.0	77.6	87.2	73.5	70.0	142.8	84.4	134.2	113.7
28-Oct	90.0	77.8	86.8	73.3	70.0	142.1	83.5	133.8	114.6
4-Nov	90.0	77.9	87.2	72.3	68.0	142.1	84.8	131.7	111.0
11-Nov	91.0	76.8	87.6	72.4	68.0	134.4	82.9	127.5	107.1
18-Nov	91.0	76.4	87.1	71.8	66.0	140.0	86.0	126.0	105.5
25-Nov	91.0	75.9	87.2	71.9	68.0	140.0	79.0	126.4	105.9
2-Dec	91.0	76.0	87.6	71.2	68.0	133.7	82.0	125.0	103.4
9-Dec	91.0	75.8	86.7	71.0	68.0	133.7	83.2	119.2	99.7
16-Dec	91.0	75.8	87.2	71.4	64.0	133.7	82.9	117.0	96.3
23-Dec	90.0	73.7	86.6	70.5	64.0	126.0	80.0	112.9	92.5
31-Dec	91.0	74.8	86.6	70.9	64.0	126.0	79.3	113.2	93.4



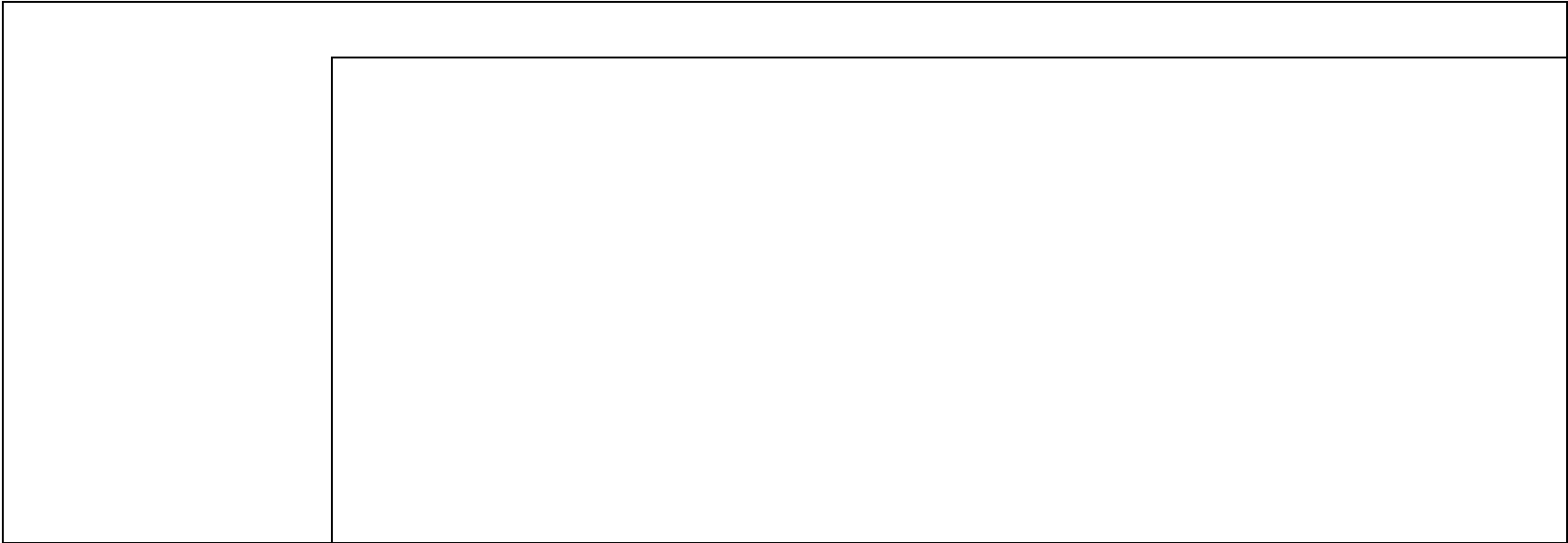
	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	286	0
FEB	310	0
MAR	365	0
APR	391	0
MAY	369	0
JUN	317	0
JUL	312	0
AUG	316	0
SEP	299	0
OCT	277	0
NOV	311	0
DEC	288	0
ANN	3842	0



	Average Sensible Cooling Load	Average Sensible Heating Load	Average Latent Cooling Load	Average Latent Heating Load
	(Btu/cfm)	(Btu/cfm)	(Btu/cfm)	(Btu/cfm)
JAN	3291	-58	4430	0
FEB	3855	-30	3960	0
MAR	4922	-10	4688	0
APR	6479	-1	6177	0
MAY	5081	0	8022	0
JUN	3981	0	10147	0
JUL	3586	0	8661	0
AUG	3560	0	10612	0
SEP	3123	0	10298	0
OCT	2924	0	9663	0
NOV	3496	-6	9984	0
DEC	3248	-55	6470	0
ANN	47546	-160	93112	0

Average Annual Solar Radiation – Nearest Available Site
(Source: National Renewable Energy Laboratory, Golden CO, 1995)

No Solar Radiation
Data Available

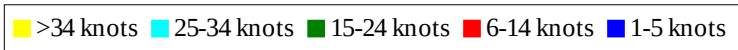
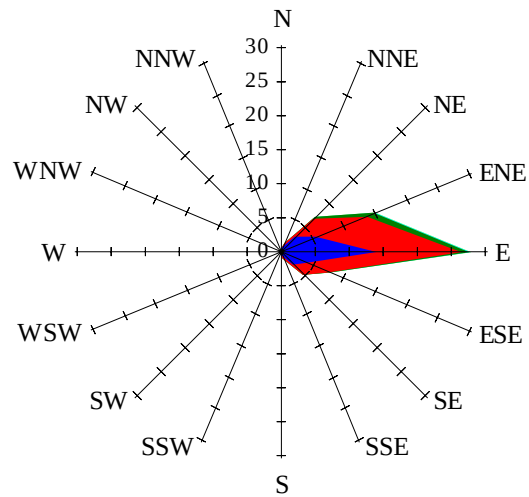


Average Annual Solar Heat and Illumination – Nearest Available Site

(Source: National Renewable Energy Laboratory, Golden CO, 1995)

Wind Summary - December, January, and February

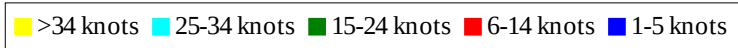
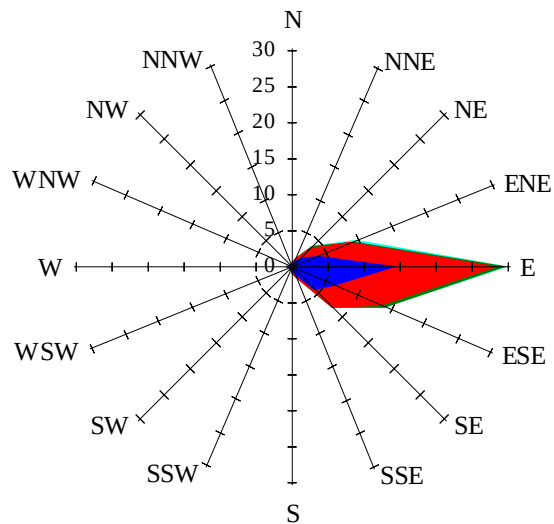
Labels of Percent Frequency on North Axis



Percent Calm = 35.62

Wind Summary - March, April, and May

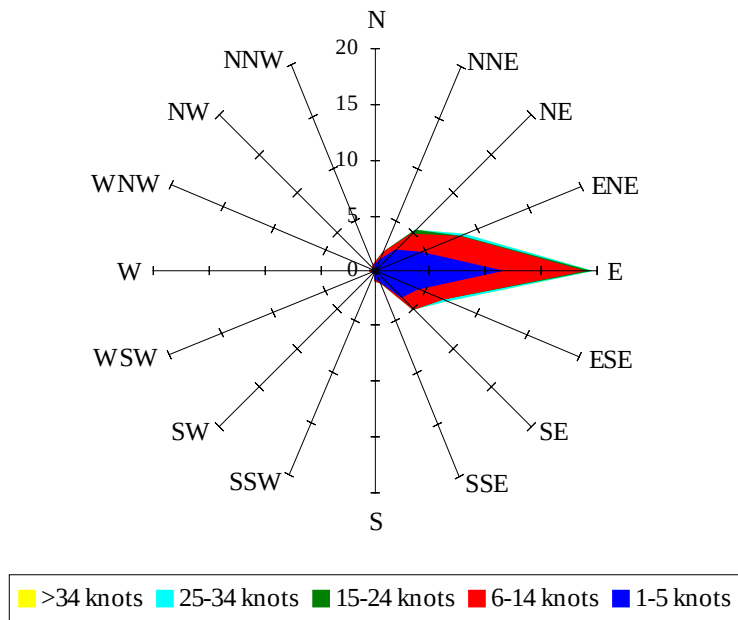
Labels of Percent Frequency on North Axis



Percent Calm = 30.39

Wind Summary - June, July, and August

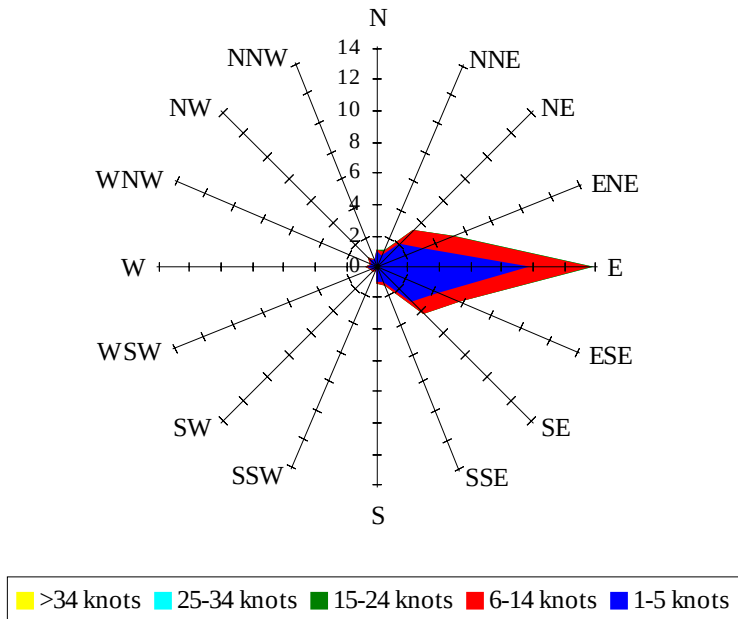
Labels of Percent Frequency on North Axis



Percent Calm = 48.98

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 60.72